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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/625,336	07/25/2000	Moris Kori	004742/AMI-00-07	7523

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APPLIED MATERIALS, INC.
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SANTA CLARA, CA 95050

EXAMINER

MOORE, KARLA A

ART UNIT	PAPER NUMBER
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1763

DATE MAILED: 12/24/2002

18

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Applicati n No.

09/625,336

Applicant(s)

KORI ET AL.

Examin r

Karla Moore

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-- The MAILING DATE of this communication appears on th cover she t with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10/22/02.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 and 22-25 is/are rejected.
- 7) ☒ Claim(s) 21 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 15,17.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

2. Claims 1-15 and 22-24 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent Publication No. 2001/400441250 to Werkhoven et al.

3. Werkhoven et al. disclose a method for forming a layer on a substrate disposed in a processing chamber, said method comprising: chemisorbing onto said substrate alternating monolayers of a first compound and second compound (paragraph 18), with said second compound having fluorine atoms associated therewith, with each of said first and second compounds being introduced into said processing chamber along with a carrier gas; and controlling a quantity of said fluorine atoms associated with the monolayer of said second compound as a function of said carrier gas (paragraph 48, 116). The carrier gas is selected from a group of gases consisting of nitrogen, argon and hydrogen (paragraph 61). The first compound (triethyl boron or diborane) includes a boron containing compound (used for doping to increase conductivity-paragraph 7) and the second compound is a refractory metal (WF_6) selected from the group consisting of titanium and tungsten (paragraphs 46-47).

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4. The method further comprises purging said processing chamber following chemisorption of each of the alternating layers. The purging process includes both introducing a purging gas therein and subsequently pumping said process chamber to evacuate all gases disposed. The purge gas and carrier gas may have identical or differing constituents as each are selected from the same group of compounds -- hydrogen, nitrogen and argon (paragraph 65).

5. With respect to claim 15, Werkhoven further discloses a processing system for processing a substrate in Figure 1, said system comprising: means for chemisorbing, onto said substrate, alternating monolayers of a first and a second compound having fluorine atoms associated therewith, with each of said first and second compounds being introduced into said processing chamber along with a carrier gas and means for controlling a quantity of fluorine atoms associated with said second compound as a function of said carrier gas.

6. With respect to claims 22-24, which recite that hydrogen is the carrier gas for the claimed invention, Werkhoven et al. teach that hydrogen may be used as the carrier gas.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 16-20 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Werkhoven et al. in view of Japanese Patent No. 03056678 to Tazaki.

9. Werkhoven et al. disclose a processing system as described above which further comprises: a body (Figure 1, 12) defining a processing chamber; a holder (18) disposed within said processing chamber to support said substrate; a gas delivery system (46, paragraphs 45, 48) in fluid communication with said processing chamber; a first temperature control system (paragraph 41) in thermal

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communication with said processing chamber; and a pressure control system (paragraph 59) in fluid communication with said processing chamber.

10. However, Werkhoven fails to teach the use of a controller in electrical communication with said gas delivery system, said temperature control system and said pressure control system or memory in data communication with said controller, said memory comprising a computer-readable medium having a computer-readable program embodied therein, including a first set of instructions for controlling the gas delivery system to chemisorb alternating monolayers of a first and second compound onto a substrate, a second set of instructions to control said gas delivery system to control a quantity of fluorine atoms associated with the monolayer of said second compound by introducing, into said processing chamber, a carrier gas along with said first and second compounds/reactive gases and two further sets of instructions to control said gas system to purge said processing chamber by introducing purge gas therein following chemisorption of each of the alternating monolayers and to control said pressure control system to purge said processing chamber by evacuating said processing chamber following chemisorption of each of the alternating monolayers.

11. Tazaki teaches the use of a controller in electrical communication deposition processes and memory in data communication with the controller, said memory comprising a computer-readable medium having a computer readable program embodied therein, said computer-readable program including instructions for carrying out processes for forming a layer on a substrate for the purpose of forming and executing a program for forming a deposition layer effectively.

12. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a memory in communication with a controller with a computer readable program therein in Werkhoven in order to execute a program for forming a deposition effectively as taught by Tazaki.

13. With respect to claim 20, the purge gas and carrier gas may have identical or differing constituents as each are selected from the same group of compounds -- hydrogen, nitrogen and argon (paragraph 65) and the apparatus would be capable of supplying identical or different constituents.

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14. Further, the courts have ruled that expressions relating the apparatus to contents thereof during an intended operation are of no significance in determining the patentability of the apparatus claim. *Ex parte Thibault*, 164 USPQ 666, 667 (Bd. 1969).

15. With respect to claim 25, which recite that hydrogen is the carrier gas for the claimed invention, *Werkhoven et al.* teach that hydrogen may be used as the carrier gas, as noted above.

Allowable Subject Matter

16. Claim 21 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

17. The following is a statement of reasons for the indication of allowable subject matter: The prior art fails to teach a method as recited in claims 1, 3 and 6, wherein the purge gas and the carrier gas have differing constituents.

Response to Arguments

18. Applicant's arguments filed 10/22/02, with respect to the applicability of *Werkhoven et al.* to the claimed invention, have been fully considered but they are not persuasive.

19. Applicant argues that *Werkhoven et al.* fails to teach, show or suggest controlling a quantity of fluorine atoms associated with the monolayer of said second compound as a function of said carrier gas, as described in claims 1 and 10, or means for controlling a quantity of said fluorine atoms associated with the monolayer of said second compound as a function of said carrier gas. While the claimed invention and the cited reference utilize differing methods and apparatus for accomplishing the above, the present claims do not define over the prior art. *Werkhoven et al.* teach the use of a carrier gas which is controlled by a mass flow controller. The mere presence of the carrier gas influences the quantity of fluorine atoms associated with the monolayer of said second compound, as it is the carrier gas which is used to transport the second compound (and its associated fluorine atoms) to the substrate to form the monolayer. Examiner notes that the claims do not recite "using a carrier gas to remove fluorine atoms

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associated with a monolayer of a second compound", as described in the specification of the present application.

20. Applicant's arguments filed 10/22/02, with respect to the applicability of Tazaki to the claimed invention, have been fully considered but they are not persuasive.

21. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

22. Examiner cited Tazaki for its teachings of providing a controller in electrical communication with deposition processes and memory in data communication with the controller, said memory comprising a computer readable medium having a computer-readable program embodied therein, said computer readable program including instructions. The apparatus is used for effectively executing a deposition process. Examiner relies on Werkhoven et al. for providing the specific deposition process which is to be carried out using the control apparatus. Applicant's claimed invention was found to be obvious over the combination.

16. With respect to Applicant's arguments and claim 20, as noted above, the apparatus of Werkhoven et al. would be capable of supplying a carrier gas and a purge gas made up of differing constituents and because the claim is drawn to an apparatus, Werkhoven et al. is applicable prior art. The courts have ruled that expressions relating the apparatus to contents thereof during an intended operation are of no significance in determining the patentability of the apparatus claim. *Ex parte Thibault*, 164 USPQ 666, 667 (Bd. 1969).

23. With respect to new independent claims 22-25, Applicant argues that the prior art does not teach using hydrogen as a carrier gas, rather than other inert gases. The prior art, however, does teach using hydrogen gas as a carrier gas and this is sufficient for rendering the present claims anticipated and/or obvious over the prior art.

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Conclusion

24. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

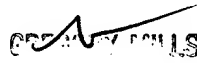
A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karla Moore whose telephone number is 703.305.3142. The examiner can normally be reached on Monday-Friday, 8:30am-5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Mills can be reached on 703.308.1633. The fax phone numbers for the organization where this application or proceeding is assigned are 703.872.9310 for regular communications and 703.872.9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703.308.0661.

km
December 19, 2002


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